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BIOFUEL SUSTAINABILITY STANDARDS AND PUBLIC POLICY: A CASE STUDY OF SWEDISH ETHANOL IMPORTS FROM BRAZIL

by

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[*] The views expressed in this study are those of the author and do not necessarily reflect those of the OECD or of any of its Member governments. This document is not available for public distribution.

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Simon Bolwig[2] and Peter Gibbon[3]

Abstract: Public demand for assurances that the liquid biofuels (ethanol and biodiesel) they choose to or are required to use in their vehicles are produced and traded in ways that consider the environment and the local populations has led to a number of public and private initiatives to develop sustainability standards for those fuels. Central to these standards are criteria addressing the direct, and sometimes also indirect, greenhouse gas emissions resulting from the production, transport and use of the biofuels. This case study examines the first scheme applied to a traded biofuel, the Verified Sustainable Ethanol Initiative (VSEI), a private initiative of the Swedish fuel-ethanol supplier, SEKAB. VSEI went into operation in August 2008 to verify that the ethanol it was importing from Brazil met its own minimum standards for "field-to-wheel" (life-cycle) greenhouse-gas emission standards and a number of other environmental, as well as social, criteria. The study first explores the broader policy context behind the establishment of the VSEI, noting especially the public debates that informed the criteria that were ultimately selected. It then examines the salient features of the VSEI, focusing on those relating to carbon emissions, and the process by which its standards were developed. The Initiative's brief history in applying and verifying conformity with the standards is discussed. The study notes that the perceived benefits to Brazilian producers participating in the Initiative is that it reduces consumer doubts about their product, and reduces competition from producers not participating in the Initiative; for SEKAB it increases the company's credibility in various private and public forums working on sustainability standards for biofuels, and gives it a first-mover advantage once mandatory regulations relating to the sustainability of biofuels go into force. Whether, on balance, both market access and environmental outcomes are improved as a result of the VSEI is, however, difficult to assess at this early stage and will hinge on how and when recognized international standards begin to emerge.

1. Introduction

1. Growing concerns over global warming and fossil energy costs, as well as opportunities for increasing rural incomes and employment, have stimulated interest in increasing the production and use of liquid biofuels (fuels derived from biomass) for transport, both in developed and developing countries. Biofuels are generally presumed to result in the generation of less carbon than fossil fuels over their life-cycle, especially those based on feedstock grown in tropical regions, such as sugar cane and oil from the seeds of *Jatropha curcus* (physic nut). But replacing fossil transport fuels with biofuels is constrained by several factors: first, most bioethanol (henceforth "ethanol") and biodiesel are currently more expensive to produce than petrol and diesel; second, the use of ethanol, in pure form or in blends above 10%, requires

[1] The views expressed in this study are those of the author and do not necessarily reflect those of the OECD or of any of its Member governments. The authors wish to express their appreciation for information and comments provided provided by Ronald Steenblik. Any remaining errors and omissions are the responsibility of the authors.

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modifications to vehicle engines; third, significant investment in the infrastructure for transport biofuel production and distribution is unlikely to happen without simultaneous stimulation of demand, especially through the promotion of so-called flex-fuel vehicles (FFVs) that run on ethanol or biodiesel; fourth, there are potential environmental, social and economic costs and risks related to the production of biofuel feedstock (CFC, 2007), and such sustainability concerns can weaken consumer support for biofuels.

2. Global trade in ethanol and biodiesel takes place largely between the South and the North, and is expanding rapidly. In this regard, the issue of sustainability has been debated especially in the context of the growing imports by OECD countries of biofuels from developing countries. Here, some argue, the expansion of feedstock production may have a range of negative effects on biodiversity, deforestation and water availability. It can also involve social issues such as food security, labour rights and safety, and the displacement of local populations from their land through "land grabbing" by large investors.[4] Others maintain that such critiques are unwarranted or exaggerated and serve mainly to protect biofuel feedstock producers in the North.

3. This paper focuses on the issue of sustainability, particularly in relation to sugar-cane ethanol production and trade. Specifically, we report on a case study of a Swedish voluntary certification scheme and an associated standard that requires Brazilian ethanol exporters to conform to environmental and social sustainability criteria. The scheme, called the Verified Sustainable Ethanol Initiative (VSEI), is owned by Sweden's largest fuel ethanol supplier, SEKAB Biofuels and Chemicals. As the paper will argue, VSEI is the industry's attempt to anticipate public regulation, especially at the EU level; it is a response to the negative perception of ethanol production among Northern NGOs and consumers; and is a means to defend a dominant market position. One of the requirements of the VSEI is a reduction in the greenhouse-gas emissions from the entire life-cycle of the imported ethanol (the "product carbon footprint") by 85% compared with the carbon footprint of fossil fuels. In this regard the paper contributes to the discussion of emerging product carbon footprint schemes and standards (Bolwig and Gibbon, 2009; Edwards-Jones et al., forthcoming, 2009; Edwards-Jones et al., 2008; Brenton et al., 2008).

4. The study is based on a review of documents and internet sites and on telephone interviews conducted by the authors in May 2009. The paper is structured as follows. The next section gives a brief overview of biofuels production and trade globally. Section 3 then traces the development of biofuel policies and mandatory standards in the EU and in two large European countries, while Section 4 discusses major international voluntary standards on sustainable biofuels. Section 5 outlines the country-level context of the VSEI (Brazil and Sweden), and Section 6 analyses the salient features of the VSEI and discusses the reactions to it from stakeholders in Sweden. Section 7 concludes.

2. The global market for biofuels

5. Global demand for transport biofuels is growing rapidly; in 2006 it reached 24.4 Mtoe[5], up from only 10.3 Mtoe in 2000 and 6 Mtoe in 1990 (IEA, 2008). Nonetheless, biofuels represented only 1.5% of total road transport fuel in 2006.[6] The Reference Scenario of the International Energy Agency projects world biofuel supply to increase to 118 Mtoe in 2030, meeting 5% of total road-transport fuel demand

[4] Based on a survey of media reports, von Braun and Meinzen-Dick (2009) identify at least eight cases where foreign corporations have secured, or have attempted to secure, through purchase or lease, large tracts of land in developing countries for the purpose of biofuel feedstock production. The extent to which these cases involve displacement of local populations is not known. Most of the land acquisitions identified by the study were for food production.

[5] Millions of tonnes of oil equivalent.

[6] Almost all biofuels are used as road transport fuel, although small quantities of ethanol are used for aviation purposes (CFC, 2007).

(*Ibid*), while British Petroleum expects biofuels to account for 19% of all transport fuels in 2030.[7] Ethanol accounts for a much larger share of the global biofuels market than biodiesel; in 2006 the share in energy terms coming from ethanol was 83%, and in 2030 it is projected to be 79% (*Ibid*). The United States and Brazil remain the largest ethanol consumers, followed by the EU.

6. Global trade in ethanol represents 20% of total ethanol production, and this share has been rising from 12% in 2002 (IEA, 2008). Brazil is the main global exporter, accounting for around 45% of global trade in 2008.[8] It is expected to remain the world's largest ethanol exporter, but low-cost producers from Asia, Africa and Latin American and Caribbean countries may also emerge as significant exporters (CFC, 2007). The United States is the world's largest importer, while the Netherlands, Germany and the United Kingdom are the largest importers in the EU.

3. Sustainable biofuel policy and regulation in Europe

7. Encouraging greater use of biofuels in transport fuel has been an EU policy objective since 2003, when a Directive required Member States to set indicative targets for biofuels to account for 2% of their transport fuel supply by 2005 and 5.75% by 2010 (EC, 2003). By 2006 it was clear that these targets were not being met and that, for significant change to occur, they would have to be made mandatory and possibly more ambitious. Against this background a number of EU Member States, notably the UK and Germany, devised mandatory schemes to be implemented from 2007-08. The UK introduced a Renewable Transport Fuel Obligation (RTFO) requiring fuel suppliers to ensure that biofuels made up 2.5% of their aggregate sales by volume in 2008-09, rising to 5% by 2010-11. Germany introduced a Biofuels Quota Act making mandatory a minimum share of biofuels in transport fuel supply of 6.25% in 2009, rising to 8% in 2015. In both cases suppliers faced financial penalties if they do not fill their quotas.[9]

8. In a consultative document of January 2007 the EU proposed making its existing 2010 target mandatory (EC, 2007). It further proposed setting a mandatory target for a 10% biofuel share in transport fuel supply by 2020. In addition, it proposed that operators be obliged to report on the life-cycle greenhouse-gas (GHG) emissions associated with biofuel production by 2009 and that there be a mandatory requirement by 2011 for qualifying fuels to reduce GHG emissions.

9. By the time the consultative document was published, the debate on biofuels had become considerably more sophisticated than four years earlier. Environmentally, it was being debated whether new GHG emissions linked indirectly (as opposed to only directly) to biofuel production should be considered when assessing their sustainability. New GHG emissions may be caused indirectly when food-crop production replaced by biofuel production in one region is undertaken in another region on land previously under forest, pasture or savannah. Socially, the impact of increased biofuel production on food-crop prices, and thereby poverty, also emerged as an issue. Both issues had been identified as concerns by the so-called Cramer Committee, set up in the Netherlands in 2006 in the run-up to drafting Dutch national legislation in the area. The Cramer Committee proposed that any mandatory quotas should distinguish "sustainable" from other biofuels. "Sustainable biofuels" were defined as those whose production and consumption led to a net reduction in GHG emissions, and which fulfilled a number of other environmental and social conditions.

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7 *Source*: http://english.unica.com.br/noticias/show.asp?nwsCode={9F75FA37-3ADA-42B1-8910-A497835C35D1}

8 Brazilian exports include volumes exported to countries participating in the Caribbean Basin Initiative and then re-exported, mainly to the United States.

9 In the UK in 2008-09 suppliers not meeting these requirements (or not buying achieved quota from other suppliers) have to pay the government GBP 0.15 (USD 0.23) per litre for each litre below their quota. They are also "named and shamed".

10. The Cramer Committee's proposals were incorporated, albeit in diluted forms, in a draft EU Directive on renewable energy published in January 2008 (EC 2008) and in the version of the UK RTFO scheme implemented in April 2008. The draft Directive stated a requirement for EU Member States that the GHG emission savings from the use of biofuels qualifying for compliance targets or financial support shall be at least 35%, with this calculation taking into account only direct land-use changes arising from biofuel production. It further required that Member States specifically exclude from compliance those biofuels produced on land which previously embodied high levels of carbon stock, or on land which previously had a high biodiversity value, or (in the case of biofuels of EU origin) which had been produced in contravention of EU cross-compliance requirements (Article 15). Operators whose fuel was used to meet the targets would be compelled to provide verification of compliance with these conditions, although the Commission also reserved the possibility of approving "a voluntary national or international scheme setting standards[10] for the production of biomass products" – certification to which would confer automatic verification (Article 16). The Commission itself was to be responsible for monitoring and reporting at intervals on indirect land-use changes, commodity price changes and changes in the availability of foodstuffs in producing countries.

11. The RTFO (UK Department of Transport, 2008) stated that qualifying biofuels should realize a 40% GHG emission savings by 2008-09, rising to 45% in 2009-10 and 50% in 2010-11, and included in the calculation the effects of direct land-use changes. However, these targets currently have only indicative status. Responsibility for monitoring indirect land-use changes is, as in the EU case, allocated to the administering agency (the Renewable Fuels Agency), not to individual operators. However, there is an indicative requirement on operators that 30% of qualifying feedstock meet a qualifying environmental standard (rising to 50% in 2009-10 and 80% in 2010-11). Six qualifying environmental standards are identified as well as two qualifying social standards. In addition, the scheme has its own "meta-standard", setting out both environmental and social parameters in considerable detail.[11] This meta-standard is very similar to the "Draft Zero" standard of the Roundtable on Sustainable Biofuels (RSB, 2008), except that a full set of indicators are provided in the RTFO. However, the RTFO does not refer to indirect land-use changes, and fuel suppliers' reporting requirements in relation to the different qualifying criteria are phased in gradually rather than all being demanded from the outset.

12. During 2008, both the draft Directive and the RTFO were subject to critique and revision, although the latter process remains incomplete. In the EU, two processes have run in parallel. An Ad Hoc Committee of Experts (from Member States) was set up, reporting to the Council, to draw up "core sustainability standards for biofuels" for incorporation into the revised Renewable Energy Directive and a parallel revision of the Fuel Quality Directive (98/70/EC).[12] At the same time, the draft Directive was debated in the Environment Committee of the European Parliament. In July 2008 this Committee voted in favour of modifying downwards the target that had been proposed in 2007, to require that biofuels make up only 4% of transport fuel supply by 2015.

13. A revised Renewable Energy Directive was eventually adopted by the EU Council and the European Parliament at the end of March 2009 (EC, 2009). This retained the target for 10% of transport energy to come from renewable sources by 2020 and determined that this should be set at the same level by

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10 The reference is to environmental standards only.

11 The qualifying environmental standards are Linking Environment and Farming (LEAF), the Roundtable on Sustainable Palm Oil standard, the Sustainable Agriculture Network/Rainforest Alliance standard, the Basel Criteria for Soya, the Forest Stewardship Council standard and the Assured Combinable Crops Scheme standard. The two qualifying social standards are the Roundtable on Sustainable Palm Oil standard and the Sustainable Agriculture Network/Rainforest Alliance standard.

12 A revision to the Fuel Quality Directive was necessary to allow higher biofuel blends in petrol, in order to make possible the achievement of the targets stated in the draft Renewable Fuels Directive.

all EU Member States. In addition, while retaining from the original draft the requirement that qualifying biofuels should save 35% in GHG emissions, it specified that this would rise to 50% by 2017 and to 60% by 2018. Furthermore, it added impacts of biofuel production on land rights and labour rights to the list of circumstances that the Commission was responsible for monitoring and reporting on at intervals. Otherwise, the draft document was largely reproduced intact.

14. Shortly before this, the Council and Parliament approved an amendment to the Fuel Quality Directive. Among other things, this approved the phasing-in of a new petrol blend containing 10% ethanol (E10), while continuing to make provision for 5% ethanol blends until 2013 to "avoid potential damage to old cars" (EC, Memo/08/800).[13]

15. Meanwhile in the UK, three reports of varying degrees of criticality of government policy appeared during 2008. Two of these, by the House of Commons Environmental Audit Committee (2008) and the Royal Society (2008), criticized the non-mandatory status of the environmental and social standards promulgated in the RTFO. The Royal Society report also heavily criticized the fact that certain biofuels with low or negative GHG emission savings could qualify as meeting the obligation, since qualification by any individual operator is based on aggregate performance. The third, and politically most authoritative report (RFA, 2008a), recommended the introduction of far tighter sustainability standards than appear to have been contemplated anywhere else. According to this report, a biofuel should only qualify as sustainable if it has not been produced on land previously under food production — i.e., it may only qualify if it has been produced on land that was idle or marginal. Meanwhile, "the introduction of biofuels should be significantly slowed" until these standards are introduced "and demonstrated to be effective". The RFTO target of a 5% share in road fuel transport should be postponed from 2010 to 2013-14, and any further increase in the target beyond 2013-14 should be adopted only on the basis of advanced technologies, not existing ones. The report recommended that a target of 5-8%, including 1-2% reserved for production from advanced technologies only, should replace the current EU target of a 10% biofuel share in road fuel transport by 2020.

16. Following the RFA report, the UK Government released a consultation document outlining a revised RTFO. The RTFO for 2009-10 would be 3.25% rather than the 3.75% average blend rate envisaged earlier, with later increases following the RFA recommendations. The document (RFA, 2008b) also stated that the UK government had "successfully negotiated … a commitment for (EU) member states to work toward an agreed methodology for measuring indirect effects of biofuel production" within the process of revision of the Renewable Fuels Directive.

4. International biofuel voluntary standards

17. There are a range of initiatives – private, public, national and international – that seek to enhance the sustainability of biofuels production and trade through voluntary standards. We discuss here those international initiatives that are expected to gain wider influence on standard setting, globally and within the EU.[14] The first and most important one is the Roundtable on Sustainable Biofuels (RSB), lead by the Ècole Polytechnique Fèdèrale de Lausanne and supported by a large and diverse group of stakeholders.[15] In August 2008, the RSB launched a draft "global sustainability standard for biofuels" (Version Zero) which is designed as a "meta standard", intended to incorporate existing certification standards and schemes

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13 *Source*: http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/800

14 Other international initiatives are the UNCTAD Biofuels Initiative (launched in 2005), FAO's International Bioenergy Platform (since 2006), and the IEA Bioenergy Task 40 on International Sustainable Bioenergy Trade (Source: UNCTAD, 2008). None of these initiatives have developed their own standard, however.

15 The RSB website is located at http://cgse.epfl.ch/page65660.html.

rather than replace them (RSB, 2009). Following a consultation process, the first version of the standard is due in June 2009. The RSB is also developing a third-party certification system and indicators for conformity assessment and will establish a multi-stakeholder Standards Board to govern the future development of the standard (*Ibid*). Once implemented, the RSB standard is likely to dominate voluntary standard setting on biofuels, and will possibly also influence the design of mandatory regulations.

18. The second initiative is lead by the European Committee for Standardisation (www.cen.eu), the umbrella organisation for national standards bodies within the EU. The CEN initiative aims at developing a voluntary "meta standard" for all forms of bio-energy (not just transport biofuels) relating to the EU renewable energy directive (see above) (WWF, 2009). A key element of this work is the development of social sustainability criteria as a voluntary supplement to the criteria in the EU Renewable Energy Directive, which mainly addresses environmental concerns (*Ibid*).

19. Thirdly, Since 2006, the Global Bioenergy Partnership (GBEP), an initiative of the G8+5 (the G8 economies plus Brazil, China, India, Mexico and South Africa), have been working to " ... support wider, cost-effective biomass and biofuels deployment, particularly in developing countries where biomass use is prevalent." In 2008 the GBEP was given a renewed mandate by the G8 Hokkaido Toyako Summit to "work with other relevant stakeholders to develop science-based benchmarks and indicators for biofuel production and use". As part of this work, the GBEP's Task Force on GHG Methodologies has been

> [W]orking to analyse the full well-to-wheel lifecycle of transport biofuels and solid biomass, and to develop a harmonized methodological framework for the use of policy makers and stakeholders when assessing GHG impacts by which the results of GHG lifecycle assessments could be compared on an equivalent and consistent basis. The main deliverable of this Task Force is a methodological framework for international and domestic policies to help assess the reduction of GHG emissions, contributing to climate change mitigation and energy security increase.[16]

20. At its 14 May 2009 meeting, the GBEP's Steering Committee endorsed the publication of the Task Force's report on the GBEP Methodological Framework for GHG Lifecycle Analysis of Bioenergy. Like the RSB standard, the GBEP Methodological Framework will be named "Version Zero", reflecting the understanding that it will be updated and improved in the future. Although the Framework does not create a standard for the performance of biofuels, it does establish an internationally agreed basis for assessing their life-cycle greenhouse-gas emissions.

21. Fourth, more recently, the International Organization for Standardization (ISO) approved a Preliminary Work Item (PWI) on "Sustainability criteria for biofuels". The PWI stage pertains to a work item that is not ready to progress onto further stages, but for which there is general agreement that ISO should add it to its work programme. ISO is expected to call a preliminary meeting by June 2009, to see what work can be scoped, with a possible new project committee to be proposed to take the work forward.[17]

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16 Source : www.globalbioenergy.org/programmeofwork/en/.

17 Source : http://www.standards.co.nz/touchstone/Issue+04/Environment/ISO+sustainability+criteria+for+biofuel+-+outcome.htm. The International Organization for Standardization has also developed, or is developing, standards that relate to *how* life-cycle greenhouse gases are verified and reported. These include ISO 14064-3:2006 (*Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions*); ISO 14065:2007 (*Greenhouse gases — Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition*); ISO/WD 14066 (*Greenhouse gases — Competency requirements for greenhouse gas validators and verifiers document*);

22. Finally, the International Sustainability and Carbon Certification (ISCC) Project, conducted by Meó Corporate Development GmbH, is developing a certification system for biomass and bioenergy that is "implementable in practice: ISCC is an internationally oriented, pragmatic certification system, which keeps administration requirements as low as possible, reduces the risk of non-sustainable production and can be used as verification for greenhouse gas emissions from biomass and bioenergy during their life cycle".[18] ISCC is financially supported by the BMELV (Germany's Ministry of Food, Agriculture and Consumer Protection) through FNR (Agency for Renewable Resources).

5. Ethanol in Brazil and Sweden

Ethanol production and export in Brazil

23. Brazil is the world's second-largest ethanol producer after the United States, and accounted for 37% of global production in 2007.[19] Brazil began to produce fuel ethanol from sugar cane on a large scale in the 1970s, and by 2008 the country could boast to having more than 400 ethanol production plants, while sugar cane destined for ethanol production accounted for about 6% of the cultivated agricultural area (Enerdata, 2009a).[20] Ethanol production has increased considerably in recent years, from 10.6 GL (10^9 litres) in the 2000/01 crop year to 22.5 GL in 2007/08 (UNICA, 2009). The industry's objective is to increase production to 65 GL in 2020 (Enerdata, 2009a). Production is mainly destined for the domestic market, which has expanded greatly since 2003 due to increased use of flex-fuel vehicles (FFVs), which in Brazil's case means vehicles that can run on any blend of anhydrous ethanol and gasoline. FFVs were first introduced on the Brazilian market in 2003 and made up 86% of all sales in 2007.[21]

24. Brazil's ethanol exports have boomed in recent years, rising from 0.23 GL in 2000 to 5.12 GL in 2008, and between 2007 and 2008 export volumes increased by 46% (UNICA, 2009). In the context of the present study, it is noteworthy that the share of exports in total ethanol production increased from less than 1% in 2000/01 to 16.1% in 2007/08.[22] The largest importer of Brazilian ethanol is the United States, followed by the Netherlands, through which much of the Europe's imports of fuel ethanol pass.

The ethanol market in Sweden

25. Sweden is Europe's largest consumer of fuel ethanol on a per capita basis. Consumption has increased steadily since 2000 and reached 0.423 GL in 2008, up from 0.322 GL in 2006 (F.O. Licht, 2009).[23] Ethanol is used in three types of transport fuel: The first is E85, which consists of 85% ethanol

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ISO/NP 14067-1 (*Carbon footprint of products — Part 1: Quantification*); and ISO/NP 14067-2 (*Carbon footprint of products — Part 2: Communication*). Only the first two standards have been completed; the rest, as of May 2009, were still under development.

18 *Source*: www.iscc-project.org/e711/element712/090218_ISCCBro_en_eng.pdf; www.globalgap.org/cms/upload/Resources/Presentations/Cologne/Henke_Jan.pdf

19 *Source:* www.ethanolrfa.org/industry/statistics/#E.

20 Biomass accounted for 30% of Brazil's total energy consumption in 2007 (Enerdata, 2009).

21 Cars designed to run exclusively on pure hydrous ethanol (ethanol containing no more than 5% water) have been sold in Brazil since 1979, but are now being replaced by flex-fuel cars. Almost 2 million flex-fuel cars were sold in Brazil in 2007 (UNICA, 2009).

22 Authors' calculations, based on data published by UNICA (2009).

23 In 2007, ethanol accounted for 2% of Sweden's total transport fuel consumption (Swedish Energy Agency, 2008, p. 55). Renewable motor fuels (ethanol, biodiesel and biogas) supplied about 4% of Sweden's energy used for road traffic (*Ibid*, p. 76).

and 15% petrol.[24] It is used by FFVs that run on E85, pure petrol or a mixture of the two. E85 accounts for the major share of the rise in Sweden's consumption of fuel ethanol since 2000. Its growth is related to the rapid increase in the number of FFVs sold in Sweden by Saab, Volvo and Ford. Today there are 147 000 such vehicles, accounting for 3.4% of all registered passenger vehicles in Sweden.[25] In March 2009, FFVs accounted for one-third of all sales of passenger cars powered by spark-ignition engines (21% of all passenger-car sales), the same share as for 2008 as a whole. E85 is offered by 1400 out of 3500 filling stations in Sweden, operated by 11 petrol companies.[26]

26. The second type, ED95, contains about 95% ethanol and 5% ignition improver, and has been developed by SEKAB for heavy diesel vehicles (lorries and buses) with modified engines.[27] About 600 buses in Sweden are running on ED95. In anticipation of an increase in the number of long-distance vehicles with ethanol engines, up to 10 filling stations offering ED95 fuel are planned for construction by 2010; these will be placed along major traffic arteries and at freight terminals (Swedish Energy Agency, 2008). The third type, E5, accounts for the largest part of Sweden's ethanol consumption. Nearly all petrol sold in Sweden contains at least 5% ethanol, the highest permissible blend ratio within the EU and a requirement of the Swedish government. As mentioned, the EU recently approved the phasing in of 10% blends.

27. Sweden's rising ethanol consumption is based mainly on imports, as domestic production is negligible (0.070 GL). In 2008, Sweden imported an estimated 0.295 GL of ethanol[28], equivalent to about 70% of consumption. Most of this ethanol was supplied by Brazil.

Swedish government policy on transport biofuels

28. The Swedish government applies numerous policy instruments to stimulate an increased share of ethanol (and biodiesel) in transport fuel consumption (USDA, 2006; Kutas et al., 2007). The total cost of government support to biofuels has been estimated at SEK 1.7 billion (€ 159 million) in 2008 (Swedwatch, 2009). Among the tax incentives, neither energy taxes nor CO_2 taxes are applied to ethanol or biodiesel; these taxes represented about 30% of the price of petrol and 40% of the diesel price in June 2006. In addition, during the period April 2007 to the end of 2009 the Government of Sweden is offering a SEK 10 000 (around € 950) subsidy on purchases of "green" (including flex-fuel) vehicles by private individuals, while companies that purchase such vehicles receive a 30% investment subsidy.[29] Other demand-side incentives for FFV owners include exemption from Stockholm's congestion tax, free parking

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24 The share of petrol is 25% in the winter to facilitate cold starts at low temperatures.

25 Several other car manufacturers are now also selling flex-fuel cars in Sweden, including Audi, Citroën, Peugeot, Renault, Seat, Skoda and Volkswagen.

26 *Source*: www.Sekab.com.

27 ED95 is used mainly by ethanol buses developed by Swedish Scania. In 2007, Scania introduced a new ethanol hybrid bus, which reduces fuel consumption by at least 25%.

28 In the absence of precise data on re-exports, this figure was calculated as the total volume Ethyl Alcohol imported (517,181 cubic meters) minus the volume exported (222,493 cubic meters), according to data provided in F.O. Licht (2009). We note that the exports are likely to be 90% or more fuel ethanol, since domestic consumption of non-fuel ethanol exceeds domestic production, and in any case accounts for only around 10% of total ethanol consumption. Obtaining reliable data on the volume and origin of Sweden's ethanol imports is made difficult by the fact that much of this ethanol is imported through the Netherlands.

29 According to the Government's new climate bill, these subsidies will be replaced by an exemption of "green" cars from vehicle tax for the first 5 years, while vehicle tax will be raised by SEK 5 per gram (€475 per kg) of carbon dioxide a car is rated to emit over a standard kilometre. *Source*: Ministry of Finance of Sweden (www.sweden.gov.se/sb/d/11760/a/122175).

spaces in most of the largest cities, and discounts of up to 20% on automobile insurance. Also, the Swedish Government requires that 25% of their vehicle purchases (excluding police, fire and ambulance vehicles) must be alternative-fuel vehicles.[30] Since 2005, large gas stations have been required to sell at least one type of biofuel, and this regulation was expanded to include small gas stations in 2009. The Government of Sweden was also one of the EU Member States, along with Spain, which requested an amendment in the European Commissions' Fuel Quality Directive to increase the percentage of permitted ethanol in petrol from 5% to 10%.

29. In February 2008, SEKAB, through the Swedish National Board of Trade, requested the EU Customs Code Committee that the ethanol it imports for production of E85/E95 be exempted from the € 0.192 per litre (equivalent to a 30% ad valorem) tariff applicable to imports of undenatured ethanol from countries outside the EU. Such a reduction is possible under EU's Processing under Customs Control (PCC) provision, which "means that goods may be processed into products which are subject to a lower duty rate before they are put into free circulation. The import duty advantage obtained should contribute to creating or maintaining processing activities in the Community".[31] The high import tariff of undenatured ethanol is a legacy of its classification as an agricultural product, from the days when most ethanol that was traded was intended for beverage or industrial use. Tariff reduction for ethanol nevertheless remains a sensitive issue due to producer interests within the EU. The granting of PCC permits for undenatured ethanol is thus subject to stricter rules ("customs procedures with economic impact") than most other products: permits are granted only to individual companies, as opposed to all companies within a country, and permits are only given for one year, compared with the normal three years. The Committee approved SEKAB's application by a very narrow margin of votes, and the imported ethanol was instead classified as a chemical (HS 3824.90, the same 6-digit tariff line as for biodiesel), which faces a much lower tariff (6.5%).[32] On 3 April 2009, upon a new application, the Customs Code Committee repeated this ruling for another one year, again by a narrow margin.[33] The permit was given on five conditions, one of which was that the imported ethanol be "sustainable".[34] The two applications, while drafted by SEKAB, were openly supported by the Swedish Government. In a Press Release issued on 6 April 2009, the Minister for Trade, Ewa Björling, stated that

> I welcome this decision, which makes it possible for biofuel prices to remain competitive. It shows an understanding for the situation in Sweden, where the market for environmentally friendly vehicles is growing ... We have gained a hearing for the Swedish line on the development and climate advantages of low tariffs on biofuels. We will now continue to work in the EU and the WTO to bring about more general tariff reductions on climate-friendly goods and services.[35]

30. Finally, in September 2007 the governments of Sweden and Brazil signed a bilateral agreement on bioenergy co-operation, including biofuels (ICSTD, 2009). The agreement includes, among other

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30 *Source:* http://en.wikipedia.org/wiki/Flexible-fuel_vehicle#Sweden.

31 Source: http://ec.europa.eu/taxation_customs/customs/procedural_aspects/imports/customs_control/index_en.htm

32 *Source:* National Board of Trade of Sweden (http://www.kommers.se/templates/News____4082.aspx).

33 *Source:* National Board of Trade of Sweden (http://www.kommers.se/templates/News____5246.aspx).

34 *Source:*

http://www.sekab.com/Sve2/Informationssidor/Information%20PDF/090407%20-%20Pressmeddelande%20tull.pdf. We could not get more detailed information on what "sustainable" means in this context, nor on the other four conditions.

35 *Source*: www.sweden.gov.se/sb/d/11858/a/123994

things, provisions on policy dialogue, research and development, co-operation in third countries and trade and investment promotion (*Ibid*).

Swedish civil society and consumer perceptions of transport biofuels

31. In Sweden, as elsewhere, many have questioned the sustainability of especially imported biofuels. The World Wildlife Foundation Sweden (www.wwf.se) has been one of the most active organisations in this debate. WWF Sweden recognises the importance of biofuels for future energy supply, but argues that the development of sustainable biofuels requires action by government and industry in a number of areas. In the area of standards, they have asked the government to support the development of a credible and transparent certification system, while the industry should "support the development of sustainability requirements within the Roundtable on Sustainable Biofuels (RSB) framework, get certified to the RSB standard as soon as this is operationalized, and purchase biofuels certified to the RSB standard" (authors' translation from Swedish).[36] WWF has published several studies on biofuels.[37]

32. Swedish consumers generally support an increased use of ethanol and biodiesel but believe that their production can have negative environmental and social impacts, according to a study from November 2008 (WWF, 2008b). The study was based on telephone interviews with 1000 adults, representing a cross-section of the Swedish population.[38] Fifty percent of the respondents agreed that ethanol and biodiesel can contribute to climate change mitigation, while 15% did not. A large majority (77%) did not think that the environment and the local populations were being considered in the production of these fuels. Regarding the kinds of concerns that the then pending EU rules on biofuels should address, 86% were of the opinion that these should include both social and environmental criteria, while only 8% thought that environmental considerations would suffice. Finally, 30% of the respondents felt that the fuel companies should carry the largest responsibility for ensuring a sustainable biofuels production, followed by the EU (21% of respondents), the Swedish government (20%) and consumers (16%).

33. In light of the critiques and concerns just described, together with the slow development of public regulation, the emergence of voluntary sustainability standards for biofuels is not surprising. There are two such standards for transport biofuels in Sweden. The first is the Nordic Ecolabel[39] for fuels, which covers ethanol, biodiesel, biogas or a mixture of these fuels. It was launched in June 2008 and the first transport fuel, biogas, was certified in November 2008.[40] No other transport biofuel had been certified to this standard as of May 2009. The second and dominant standard in terms of traded volume is the Verified Sustainable Ethanol Initiative (VSEI), developed for ethanol imported to Sweden from Brazil.

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36 *Source:* www.wwf.se/vart-arbete/skog/losningar/1194024-hallbar-etanol-kampanj-2008 (in Swedish only). The strong emphasis on the RSB may be related to the fact that its founding Steering Board chair is the former Executive Director of WWF International.

37 These include a major report (2009), three studies of biofuels production in Mozambique and Tanzania (2008), a survey of fuel companies in Sweden (2008), and an omnibus survey of consumer perceptions of ethanol and biodiesel (2008). All studies were accessed at www.wwf.se/vart-arbete/skog/losningar/1194024-hallbar-etanol-kampanj-2008.

38 The methodology used is the so-called "omnibus" survey, i.e. a survey that covers a variety of unrelated topics.

39 The Nordic Ecolabel, commonly known as "The Swan", is the official ecolabel in the Nordic countries. It was initiated by the Nordic Council of Ministers in 1989 and today covers 66 product areas.

40 *Source*: www.svanen.nu/Default.aspx?tabName=NewsDetail&newsid=59601&menuItemID=7022.

6. The Verified Sustainable Ethanol Initiative – a preliminary analysis [41]

34. The VSEI scheme has been in operation since August 2008. It is owned and operated by SEKAB, which currently supplies 90% of the Swedish market for E85 and ED95. [42] SEKAB imports all the ethanol used in these fuels from Brazil.[43] The VSEI was developed in co-operation with the Brazilian Sugarcane Industry Association (UNICA) and the trade association for ethanol in Sweden, the BioAlcohol Fuel Foundation (BAFF).

Aim and coverage of the scheme

35. The primary aim of the VSEI is to give Swedish consumers a guarantee that the ethanol provided by SEKAB and used in the E85 and ED95 is produced and traded in an environmentally and socially sustainable manner. Brazilian producers "hope the scheme will help curb criticism of Brazil's sugar cane industry, as well as dispel doubts about Brazilian ethanol's climate-related, environmental and social impacts".[44] The scheme also aims to "persuade other countries in Europe to develop systems for quality and sustainability assurance" and "to expedite the development of international regulations for biofuels" (www.sekab.com).

36. The scheme covers only ethanol imported to Sweden from Brazil, and is limited to ethanol used in the E85 and ED95 blends. It is proprietary to SEKAB and is not accessible to other importers or to producers not supplying SEKAB. In 2008, XX GL of ethanol was certified to VSEI. In the first year of its operation, 2008, ethanol from seven ethanol plants and their associated sugar-cane plantations, all located in Brazil's São Paulo State, were certified by the scheme.

Key scheme design features

Sustainability criteria

37. The criteria and verification procedure of the VSEI scheme are published on the SEKAB website in a short-hand, "bullet" format.[45] We henceforth refer to these as a "standard" for ease of presentation.

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41 When not otherwise indicated, this section is based on information published at the SEKAB (www.sekab.com) and VSEI (www.sustainableethanolinitiative.com) websites. Unfortunately, SEKAB did not have time to participate in an interview, or to answer the questions we sent to the company by email, before the deadline of this draft of the paper. The information presented in this section is therefore partial and the views of SEKAB may not be fully represented. This also means that we do not present information on the reactions to the scheme of Brazilian producers, Swedish fuel companies, the Swedish Government and consumers (sales), nor on how SEKAB responded to whatever concerns these stakeholders may have raised. It was beyond the scope of the study to interview producers in Brazil.

42 SEKAB was founded in 1985 and is owned by a regional consortium based in Northern Sweden. In 2006 SEKAB had sales of SEK 1.8 billion and has grown from 40 employees in 2003 to 140 employees in 2007. In February 2009, SEKAB negotiated a transfer to oil companies of both ethanol import and the distribution of E85, involving a reduction of its staff to about 80. SEKAB will thereafter focus on its core businesses, which is to develop technology and processes for the production of cellulosic fuels, production of green chemicals and diesel replacement fuel.

43 SEKAB is also one of Europe's leading ethanol suppliers; in 2007 it accounted for 36% of Europe's ethanol imports from Brazil (almost 0.4 GL). *Source*: www.sustainableethanolinitiative.com/Sve/Standardsidor/Filer/Per%20Carstedt.pdf

44 *Source*: Mark Lyra, Ethanol Commercial Director at Cosan, the world's largest ethanol exporter, cited in ICTSD (2009).

45 *Source*: www.sustainableethanolinitiative.com/default.asp?id=1173.

The VSEI standard has seven criteria covering climate change mitigation, biodiversity protection, other environmental issues, child labour, labour conditions and traceability:

1. At least 85% reduction in fossil carbon dioxide compared with petrol, from a well-to-wheel perspective;

2. At least 30% mechanisation of the harvest now, plus a planned increase in the degree of mechanisation to 100% (this is to reduce pollution from burning the cane fields, which is required when the cane is harvested manually);

3. Zero tolerance of felling of rainforest, and the deforestation of other forests must be in accordance with national laws;

4. Zero tolerance for child labour, in compliance with article 1 and 2 in ILO convention 138;

5. Rights and safety measures for all employees in accordance with United Nations guidelines;

6. Ecological considerations in accordance with UNICA's environmental initiative[46];

7. Traceability of the product from field to wheel (chain of custody).

For each criterion a number of sub-criteria are listed (see Annex 1), but most of these are rather fuzzy and non-specific and only in a few cases are precise, measurable indicators given. It remains unclear whether more specific sub-criteria and indicators are used at all, as the complete standard document, if it exists, is not made available to the public (Swedwatch, 2009).

38. The published version of the standard is also silent on the important fact that the VSEI criteria only apply to the sugar-cane feedstock produced the ethanol plants themselves, while excluding the sugar cane sourced by the plants from out growers (Swedwatch, 2009). The latter supply about one-third of the sugar cane used in the production of the ethanol by the certified plants (*Ibid*).

39. SEKAB emphasizes that the criteria will continue to be developed and expanded and that the scheme as a whole is "an initial step" towards an internationally recognised standard. SEKAB has published, in the form of a PowerPoint presentation, a comparison of the VSEI criteria with the 12 principles of the Roundtable for Sustainable Biofuels (RSB). This shows that the VSEI standard in 2008 did not include four of the RSB principles (rural and social development, food security, economic aspects and land rights), and that producers only partially complied with another 6 principles (consultation planning and monitoring, human and labour rights, conservation, soil, water and air).[47]

GHG assessment method

40. The information published on the website on VSEI's GHG assessment methodology generally lacks precision and detail, which prevents others (e.g. consumers and environmental NGOs) from making their own evaluation of the validity of the GHG reduction assertions made. Considering that the GHG assessment is done only for one product and one type of supply chain, it would seem entirely feasible to increase the transparency of the scheme on this important aspect. Criterion 1 in the standard includes a provision (sub-criterion) that the calculation of GHG emissions shall be done "according to RTFO

[46] This is supposedly the Green Protocol agreed between UNICA and São Paulo State.

[47] The planned "progress" for 2009 is full (compared with partial) compliance with human and labour rights and partial compliance with (compared with non-inclusion of) land rights.

principles", but the standard does not describe these principles in any detail.[48] Another provision states that the GHG assessment adopts a "field-to-wheel perspective", i.e. a life-cycle approach that includes "cultivation, production and transportation" and "total CO2 emissions from Brazil to Sweden". In the presentation of the results from the first audit of producers (see below), more detail is presented on the GHG assessment methodology, but no explicit reference is made here to the RTFO principles. Also, it is unclear what GHGs are included in the calculation; while the standard mentions only "CO_2" the audit report talks about "greenhouse gases".

41. And, finally, the standard does not take into consideration how GHG emissions are affected by indirect land-use change (iLUC) resulting from the production of ethanol. The inclusion of iLUC in life-cycle comparisons of fuels is a hotly debated issue. In May 2009, the U.S. Environmental Protection Agency, in the context of its proposed revisions to the National Renewable Fuel Standard programme, published draft estimates of life-cycle emissions for various renewable fuels which showed that the use of Brazilian sugarcane ethanol in the United States would reduce GHG emissions by up to 44%, even when taking into account iLUC (U.S. EPA, 2009). A few weeks before that announcement, the California Air Resources Board (CARB) estimated the direct GHG emissions related to Brazilian ethanol, including emissions associated with the transport of ethanol from Brazil to California, at 27.4 grammes of CO_2-equivalent (gCO_2-eq) per megajoule (MJ) of energy contained in the fuel (compared with 95.85 g CO_2-eq per MJ for gasoline), but 73.4 gCO_2-eq per MJ when emissions from iLUC were included. This value was challenged by Joel Velasco, UNICA's chief representative in North America, who countered that "Based on our assessment, the 27 gCO_2/MJ should drop to about 15-20 gCO_2/MJ. Meanwhile, the 46 gCO_2/MJ figure associated with the iLUC for sugarcane ethanol should drop to a *credit* of 10 gCO_2/MJ."[49] (emphasis added) Clearly, depending on the life-cycle analysis, and whether or not iLUC is taken into account, Brazilian ethanol either easily meets the "85% reduction in fossil carbon dioxide compared with petrol" requirement, or comes nowhere near meeting it.

Method of verification

42. Compliance with the VSEI standard is assessed annually by an auditing company hired and paid for by SEKAB. The standard specifies that "monitoring and verification of the criteria shall be done through audits by an independent, third party", but there is no requirement that the auditor must be accredited by an independent accreditation body.

43. SEKAB terms the auditing process "verification" while arguing that it does not pretend to have developed a "certification system" and that to do that is not their intention (SEKAB, 2009). However, SEKAB does not explain the difference in their view between "verification" and "certification". Combined with the lack of specificity and clarity of the standard's scope and criteria (mentioned above), this vagueness is a serious problem for the credibility of the whole VSEI scheme.

44. The VSEI scheme operates with three levels or degrees of "non-compliance": observation, minor non-compliance and major non-compliance. In the first case, the instance of non-compliance shall be corrected before the next audit (i.e. within one year); in the second, correction shall be done within three months; while instances of major non-compliance must be followed up by a plan for mitigation within 14

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48 The RTFO methodology uses default values that provide estimates of the carbon intensity of different fuel chains, and allows (and encourages) suppliers to provide additional information about their specific supply chain to increase accuracy. *Source*: www.renewablefuelsagency.org – Scope and Principles for RTFO C&S Reporting.

49 http://ethanolbrasil.blogspot.com/2009/04/unica-urges-carb-to-update-data-on.html. The assessment refered to can be downloaded from http://www.unica.com.br/download.asp?mmdCode=50F82F75-EA2D-4BB6-8832-B81C15EFFD8E.

days as well as an extra audit. It is not specified what will constitute a given degree of non-compliance for a given criterion; this decision seems to be at the discretion of the auditor. The producers are responsible for providing the documentation used in the auditing process and they alone cover the cost of compliance (but not the auditing).

The development of the scheme

45. The VSEI criteria were developed "in consensus" with the Brazilian ethanol industry. This obviously made it easier for SEKAB to identify certifiable producers while reducing the latter's cost of compliance.[50] It arguably also increased the relevance to local circumstances. SEKAB also states that the standard "where possible" was adapted to the biofuels standards proposals that were being discussed in the EU, the United Kingdom, Germany and the Netherlands.[51] This was in order to ease compliance to future mandatory regulations, particularly at the EU level. However, few if any other stakeholders were involved in the development of the VSEI scheme, as discussed below. This contradicts what is commonly considered a central part of "good practices" for standard development, formulated in ISO's Guide 59:1994 (ISO, 1994) and ISEAL's Code of Good Practice for Setting Social and Environmental Standards (ISEAL, 2006).[52] Hence, Article 7 in the ISEAL Code states that "[S]tandard-setting organisations shall ensure that participation reflects a balance of interests among interested parties in the subject matter and in the geographic scope to which the standard applies" and further that "[I]nterested parties shall be provided with meaningful opportunities to contribute to the elaboration of a standard". While a private standard setter cannot be expected to follow these Codes to the letter, one might expect that it makes an effort to comply with their central elements, or at the very least provides reasons for not doing so.

Perceived and actual impacts and stakeholder reactions

The first audit of producers

46. The first audit of producers was conducted in 2008 by the Brazilian office of the international quality assurance company SGS group. In their own view, SGS has extensive experience with sustainability assurance in biofuels supply chains[53] and the auditors used in this specific case were, again according to SGS, experienced with a number of ISO and other environmental, social and quality standards. A summary of the results of this audit was presented at a seminar held in Stockholm 28

50 One producer, Cosan, observed that "the sustainability requirements were already in line with the company's practices. The only challenge was to clearly define the criteria and to establish a methodology to measure them. Even the extensive documentation confirming they met the standards was available in Cosan's data management system since this data is used for everyday operations, such as employee management, crop monitoring and purchasing" (ICTSD, 2009). On the other hand, SEKAB maintains that it initially had problems finding producers who could supply the volumes it required.

51 SEKAB observes that none of these proposals give enough consideration to the circumstances in Brazil.

52 The International Social and Environmental Accreditation and Labelling (ISEAL) Alliance is a formal collaboration of leading international standard-setting and conformity assessment organisations focused on social and environmental issues. The ISEAL Alliance supports credible standards and conformity assessment by developing capacity building tools to strengthen members' activities and by promoting credible voluntary social and environmental certification as a legitimate policy instrument in global trade and development (ISEAL, 2006).

53 *Source*: http://www.alternativefuels.sgs.com/alternativefuels/sustainability_assurance_in_biofuel_supply_chains_biofuels.htm

November 2008 and subsequently published on the SEKAB website.[54] The audit process in this case involved on-site visits to all seven sugar-cane mills.

47. The audit results reveal that virtually all instances of non-compliance were in relation to labour rights (including health), where the auditor made 14 "observations" and noted 4 instances of "minor non-compliance". Only one other "observation" was made, in relation to Criterion 3, and no instances of "major non-compliance" were observed. It is not our purpose here to make a comprehensive analysis of standards compliance, but a few comments are warranted. Regarding Criterion 1, the producers achieved a net GHG reduction compared with petrol ranging from 77% to 81%. These achievements fall short of the 85% target, but it is unclear what actions are planned as a consequence. It is also unclear whether the responsibility of reaching the 85% target lies with the producers or the importer (SEKAB), given that the GHG assessment covers the whole supply chain. Finally, the auditor seems only to have considered transport GHG emissions up to the point of export ("harbour"), which is somewhat less than "field-to-wheel". As for Criterion 7, the auditor verified the chain of custody "from agriculture to export to Sweden"; it is unclear whether this means that the chain of custody was verified all the way to the fuel pumps in Sweden, as required by the standard.

48. Given that this was the first audit in the life of the scheme, the generally high level of compliance is noteworthy. A number of possible (overlapping) factors may account for this: the producers made great effort to comply with the standard; the aspects included in the standard were already subject to (effective) state regulation or self-regulation (through UNICA); the standard to a large extent reflects common industry practices; the producers selected for the scheme represent a small "elite" of firms with high capacity and integrity; the producers are all located outside forested areas; the criteria are relatively "weak" and so easy to meet; many criteria are not supported by precisely formulated indicators, which increases the subjectivity of the auditing; the auditor did not do a thorough job and overlooked many instances of non-compliance. It is beyond the scope of the paper to make an assessment of each of these possibilities, and no judgement lies behind this list.

Reactions from Swedish non-governmental organisations

49. At the November 2008 seminar in Stockholm, Peter Roberntz from WWF Sweden commented on the VSEI scheme.[55] He observed the following: First, it is a first good step towards sustainability and it takes up important issues in the Brazilian context, but a strategy is needed for increasing the general level of performance of the scheme. Second, the criteria on which basis compliance to the scheme is assessed were formulated exclusively by stakeholders with direct economic interests in the product, i.e. producers and the importer (SEKAB). Therefore the VSEI cannot claim to be a "third-party verification scheme" even if producers are audited by a third party. It is also problematic that the verifier is not accredited by an independent accreditation body and therefore is not required to follow certain accreditation standards (e.g. on sampling, public consultation, public reports). Third, the development and implementation of the scheme lacks broad participation and transparency. Finally, partly as a result of its narrow stakeholder base, the scheme seems to exclude important criteria, in particular regarding: social concerns related to local communities, development and food security; land rights; rules for the use of pesticides and genetically modified organisms; and detailed criteria on the conservation of biodiversity, soil and water.

50. In February 2009, Swedwatch together with three other Swedish NGOs published a report on the sustainability of the ethanol imported to Sweden, focusing on SEKAB's ethanol imported from, and

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54 *Source*: www.sustainableethanolinitiative.com/Sve/Standardsidor/Filer/Vanda%20Nunes%20SGS.pdf

55 *Sources*: PowerPoint presentation accessed at www.sustainableethanolinitiative.com/Sve/Standardsidor/Filer/Peter%20Roberntz.pdf. Authors' interview with Peter Roberntz on 18 May 2009.

investments in, Brazil (Swedwatch, 2009).[56] Regarding the VSEI standard as such, Swedwatch, like WWF Sweden, commends SEKAB for taking "some important steps towards bringing about more sustainable ethanol production" and for considering a number of important factors for the Brazilian context. The general tone of the report is critical, however. First, Swedwatch observes that the published VSEI standard is vaguely formulated (the criteria lack specification and indications of how they can be achieved). The standard and its verification method lack transparency, and SEKAB moreover denied Swedwatch access to the "complete" standard document. The report also observes that the VSEI standard was developed without consulting important stakeholders such as environmental organisations, researchers and Brazilian trade unions. Swedwatch also maintains that Brazilian producers were excluded from the design process, which contradicts SEKAB's statement noted above (paragraph 45).

51. Third, Swedwatch argues that important social concerns are missing from the standard, especially those relating to working hours and pay levels (low pay, long working hours and unsafe working conditions are the main criticisms of the Brazilian ethanol industry), the rights of indigenous people, and land rights. Fourth, as already discussed, Criterion 6 on "ecological considerations" is especially weakened by the lack of specific performance indicators (including a description of UNICA's environmental initiative). In this regard, the report observes that the local authorities have not yet approved the "plans for reduction of environmental impacts from production" as UNICA's environmental initiative (the Green Protocol) seems to require, and that the producers therefore have not started to implement these plans. Swedwatch also notes the absence of criteria on on-farm biological diversity and on the use of genetically modified varieties of sugar cane (were they to be introduced).

Responses by scheme operator to concerns raised by stakeholders

52. In their response to the Swedwatch report, SEKAB repeated its earlier argument that the VSEI criteria are under continuous improvement, and that they support international efforts to develop an "established certification system" (SEKAB, 2009). But the company also gave a new justification for the incompleteness of the scheme, namely that "an important objective in the first year was to put the question of sustainability on the agenda of the Brazilian producers. We have succeeded in this. The initiative has received a lot of attention in Brazil and many producers have contacted us to introduce our system" (authors' translation from Swedish) (*Ibid*). In response to Swedwatch's critique of lack of transparency and specificity, SEKAB promises to "publish a more elaborate description of the criteria and how they are being verified" at an unspecified date. Moreover, in the context of the RSB principles noted above, in 2009 SEKAB is planning to put more emphasis on compliance with human and labour rights, including worker health and safety, and to include a criterion on land rights. Altogether, in comparison with the RSB principles and in light of the critique from both WWF and Swedwatch, these improvements appear unambitious.

7. Concluding observations

53. Global production and trade in transport biofuels have been increasing rapidly in recent years, in response to growing demand driven by increasing fossil fuel prices and by climate change policies in the OECD that include minimum targets for the share of biofuels in transport fuels as well as various forms of public support to biofuels development. Alongside the growth in the biofuels markets, the social and

[56] The report is based on a literature review, interviews with researchers, and interviews with SEKAB staff in Sweden and Brazil. Swedwatch (www.swedwatch.org) is a non-governmental organisation that writes reports on Swedish business relations with developing countries. Swedwatch produced the report together with its member organisations Naturskyddsförening (The Swedish Society for Nature Conservation), Svenska Kyrkan (Church of Sweden) and Latinamerika grupperne (Swedish solidarity association for Latin America). Sida supported to the production of the report financially.

environmental sustainability of biofuels, particularly when produced in developing countries, have come under increasing scrutiny by both governments and civil society.

54. This case study has reviewed recent developments in the public regulation of biofuels in the EU, Germany and the United Kingdom, which were important antecedents to the VSEI standard. The most important "event" in this area was the recent formal approval of a revised EU Renewable Energy Directive. It states that 10% of transport energy must come from renewable sources by 2020 in all EU Member States, while qualifying biofuels should save 35% in GHG emissions, rising to 60% by 2018. In support of the former policy, the EU also recently approved a phasing-in of a new petrol blend containing 10% ethanol, as part of a revised Fuel Quality Directive. Furthermore, these directives include social and environmental sustainability criteria for biofuels, including "new" ones such as land rights and labour rights, although we did not examine these criteria in detail. Finally, this case study has illustrated the diversity of policy instruments that may help stimulate the demand for transport biofuels in Sweden. These include, among others, significant tax incentives, demands on fuel companies that biofuels are widely available, "green" public procurement policies, and support to companies applying for biofuel import tariff reductions in the EU.

55. The Swedish population seemed to back such policies at a general level. The case study has revealed that Swedish consumers and civil-society organisations were supporting an increased use of transport biofuels, but that they believed that these fuels were currently produced in an unsustainable manner. Both groups identified the private sector, the Swedish government and the EU as those mainly responsible for improving social and environmental sustainability in this area.

56. The study identifies several large international initiatives to promote sustainable biofuels through the development of voluntary standards, but found that at presently there are no internationally agreed voluntary standards on biofuels. The largest and most advanced of these initiatives, the Roundtable for Sustainable Biofuels, plans to publish the first version of its standard in 2009 and has started to develop a third-party certification system and indicators for conformity assessment. Complementary to the RSB standard, the Global Bioenergy Partnership is developing what it hopes will become an internationally agreed basis for assessing the life-cycle GHG emissions of biofuels. Our review also suggests that there is a growing consensus on what should be in these standards, but not on the levels at which the standards for GHG emission reductions should be set.

57. The study provides a preliminary evaluation of a private initiative to certify Brazilian ethanol producers to selected environmental and social sustainability criteria. The Verified Sustainable Ethanol Initiative (VSEI) was developed in 2008 by Sweden's largest fuel-ethanol supplier, SEKAB. The scheme was developed in a dynamic context of: rapidly increasing ethanol consumption; supportive national policies; pending EU regulation; the threat of high import tariffs; and widespread scepticism in the population about the sustainability of the ethanol fuelling the rising number of flex-fuel vehicles (FFVs). The VSEI can be seen as part of SEKAB's strategy to protect market share and maintain profits in the face of these diverse "threats", and as way to "deliver" on the relatively favourable policy environment created by the Swedish government. By doing so the VSEI may help protect the considerable investments made in ethanol production and distribution, as well as the investments made by Swedish FFV manufacturers. We do not know yet how other potential ethanol suppliers to Sweden feel about, effectively, being shut out of its fuel-ethanol market.

58. Our analysis of the VSEI and some of the reactions to the scheme suggest that the ethanol certified to its standard is not as "sustainable" as argued by SEKAB and that the criteria used largely reflect existing practices of a small elite of "green" producers. Hence, even if schemes such as the VSEI succeeds in moderating the concerns of those that use the biofuel, there is a risk that it simply means that the "most sustainable" sugarcane and ethanol is channelled to Swedish consumers, with little overall net

effect on the sustainability of biofuel production as a whole. On the other hand, the scheme is the first of its kind and most observers agree that it is a step in the right direction.

59. A key potential of the scheme lies in the "verification" of the considerably higher GHG reductions of sugar-cane based ethanol compared with biofuels made from most other feedstock. The weakest procedural points of the scheme are, however, that it was developed without broad stakeholder involvement and that its actual content (detailed criteria, indicators and GHG assessment method) and verification methods remain largely inaccessible to the public. In terms of substance, an important weak point is that the scheme has so far verified only a part of the supply chain, and taken no account of potential effects on emissions of indirect land-use change owing to ethanol production. Such an approach cannot be defended with reference to the scheme being "the first" or "under continuous development". It also seems risky from a business perspective given the policy context and consumer perceptions described above. Of course, once SEKAB delivers on its recent promise to publish a more elaborate description of the criteria and how they are being verified, many of the questions raised by the scheme may be laid to rest.

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ANNEX 1. VSEI REQUIREMENTS FOR SUSTAINABLE ETHANOL (MAY 2009)

Criterion	Sub-criteria
At least 85 % reduction in fossil carbon dioxide compared with petrol, from a well to-wheel perspective	• Field-to-wheel perspective – Cultivation, production, transportation – Total CO2 emissions from Brazil to Sweden • Calculations according to RTFO principles • Fossil input: fertilizers, pesticides, fossil energy • Renewable output: ethanol, energy (steam, electricity)
At least 30 % mechanisation of the harvest now, plus a planned increase in the degree of mechanisation to 100 %	• Benefits of mechanized harvesting: – Lower local particle emissions – Better work environment – Improved reduction of CO2 • Disadvantages: – Risk of unemployment • 30 % mechanized harvest first year • Implementation plan for 100% mechanization
Zero tolerance for felling of rain forest	• No deforestation of rainforest is permitted • Deforestation of other forests according to national laws – Permits required – Brazilian law applied: cut down 1 tree, replant 25 new • To preserve biodiversity • Land use change
Zero tolerance for child labour	• Child labor below 16 years of age – Defined according to Brazilian law – Apprentice from 14 years of age • In compliance with article 1 and 2 in ILO convention 138

Criterion	Sub-criteria
Rights and safety measures for all employees in accordance with UN guidelines	• Zero tolerance to forced labor (”slave labor”) • Workers right to organize in unions etc. • All employees must be registered • Employees must be paid at least minimum wages • Health & safety policies shall be in place and followed
Ecological consideration in accordance with UNICAs environmental initiative	• Protection of forests close to water areas • Protection of water resources • Program for reuse of water in industrial processes and for conservation of water quality • Implementation plan for soil conservation • Plan for reduction of environmental impacts from production
Continuous monitoring that the criteria are being met	• Monitoring and verification of the criteria’s shall be done through audits by an independent third party • Non compliance – Observation – Shall be corrected before next audit • Minor Non Compliance – Shall be corrected within 3 months • Major Non Compliance – A plan for mitigation shall be submitted within 14 days – Always followed by an extra audit • Full traceability of all physical flows

Source: www.sustainableethanolinitiative.com/default.asp?id=1173